UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/657,338	09/08/2003	Robert R. Rice	7784-000626	8818

27572 7590 03/27/2006

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. BOX 828
BLOOMFIELD HILLS, MI 48303

EXAMINER	
RAMIREZ, JOHN FERNANDO	
ART UNIT	**PAPER NUMBER**
3737	

DATE MAILED: 03/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/657,338	RICE ET AL.	
	Examiner	Art Unit	
	John F. Ramirez	3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *01/20/06*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

After a review of applicant's remarks, the examiner of record acknowledges the amendment to the claims on pages 2-8. Accordingly, original claim 28 has been cancelled.

Applicant's arguments filed 01/20/2006 have been fully considered but they are not persuasive. Applicant's alleges on page 11 of the amendment, that the Pavlidis reference provides no disclosure or teachings relating to "determining physiological stress based on spectrum reflections", and "measuring a blush that is characterized by increased blood flow to the cheeks". However, the examiner of record respectfully disagrees with applicant's comments. In column 5, line 26 - column 6, line 9, the specifications of the Pavlidis patent specifically states:

5

In U.S. patent application Ser. No. 09/776,470, filed 2 Feb. 2001, entitled "Detection System and Method Using Thermal Image Analysis," methods and systems for detecting anxiety through thermal facial image analysis are described. In general, the change in thermal facial image signature of an individual is used to determine whether the individual is experiencing anxiety. For example, as described therein, anxiety is accompanied by an increased local warming around the individual's eyes. This change in facial thermal pattern around the individual's eyes is typically accompanied by a concomitant cooling over the cheeks and/or concomitant warming over the carotid artery region.

Generally, this pattern of thermal change in an individual's body during an onset of anxiety (e.g., the change in the individual's thermal signature during onset of anxiety) makes physiological and evolutionary sense, as it represents a mechanism to facilitate rapid eye movement during preparedness for flight. In other words, elevated anxiety precipitates a host of physiological responses, many of which result from altered sympathetic nervous system activity. One of these responses is local redistribution of blood flow resulting in abrupt changes in local temperatures at various regions in the individual. Such changes in local temperatures in such regions are readily apparent in the human face where the layer of flesh over bone is relatively thin.

Such abrupt temperature changes in localized regions can be detected by human face emissions in both the mid-infrared thermal band (i.e., 3 microns to 5 microns band) and far-infrared thermal band (i.e., 8 microns to 14 microns band) of the electromagnetic spectrum. As one skilled in the art will recognize, such ranges may be slightly shorter or longer.

A graph of the electromagnetic spectrum is shown in FIG. 2, with the thermal infrared band shown as reference numeral 23. The thermal infrared band lies above the visible band 22 and reflected infrared band 21 of the electromagnetic spectrum.

As such, thermal infrared detectors suitable to sense temperature variations in such regions of the spectrum can be used to produce thermal (facial) images, or thermograms, representative of such local temperature changes in the human face of an individual. Such data of the thermograms (e.g., those using either one or more of the mid-infrared band and far-infrared band) may be used to determine a physiological state of the individual (e.g., anxiety), as described in U.S. patent application Ser. No. 09/776,470, which is incorporated herein by reference.

For example, as described in U.S. patent application Ser. No. 09/776,470, and as described herein with reference to FIG. 3, a thermal facial image of an individual 30 with reference to various regions of the individual's face 32 provide an individual signature that can be detected as anxiety. For example, as described above, an onset of anxiety in the individual 30 (e.g., such as that which may be induced by a startling stimulus, induced by fear when smuggling goods into a country, induced by fear arising from the need to establish an escape route when proceeding with covert operations in a secret area, etc.) is associated with a warming due to increased blood flow in the periorbital region 34 around the eyes 35 of the individual 30. The periorbital region size varies with the individual 30. This extra blood flow to the eye musculature in the periorbital region 34 is primarily redirected from the cheek regions with a corresponding cooling indicated therein.

With the above changes in temperature in the localized regions of the individual's face 32 that accompany an onset

6

of anxiety, and with suitable monitoring of emissions from the individual 30 in the thermal infrared spectrum band before the time of anxiety onset (e.g., a thermal history) and also after the time of onset, detection of transition from a prior state, e.g., a calm state, to an anxiety state can be achieved. This change in facial thermal infrared pattern or signature at the time of the transition is dramatic and can be easily recognized as described in U.S. patent application Ser. No. 09/776,470.

However, in a polygraph test setting, when thermal image data is obtained, temperature changes observed around the eyes and in the face in general are typically only subtle and not abrupt as described in the onset of anxiety with reference to U.S. patent application Ser. No. 09/776,470. As such, when viewing only thermal image data as illustrated further below, such temperature changes are almost unnoticeable. Such disparity between the thermal image data changes due to anxiety and those due to polygraph testing are likely a result of the only subtle stress imposed on polygraph subjects.

Such unnoticeable temperature changes in the thermal image data obtained during polygraph testing is shown generally in FIGS. 5A–5B. FIG. 5A shows thermal image data of a person prior to and at the beginning of responding deceptively to a question in a polygraph test. The temperature is visualized in gray scale, although any visualization scheme could be used, e.g., rainbow coloring scheme with higher temperatures represented by bright colors such as yellow and lower temperatures represented by other colors such as blue. FIG. 5B shows visualized thermal image data of a person towards the end of the person's deceptive response to the question. As can be seen in FIGS. 5A–5B, no noticeable difference in thermal image data appears.

As such, to provide for useful information according to the present invention for use in polygraph testing, the thermal image data is transformed to blood flow rate data as described further herein and as visualized in FIGS. 6A–6B. In FIG. 6A, corresponding to the thermal image data of FIG. 5A, visualization of blood flow rate in a person prior to and at the beginning of a deceptive response to a question is shown generally as a very dark image. Lighter regions 60, 62 may be generally seen in the periorbital region 60 of the face and the cheek region 62 of the face. This is indicative of changing blood flow rate in such areas.

Towards the end of the person's deceptive response to the question, visualization of blood flow rate in the person's face corresponding to the thermal image data shown in FIG. 5B is provided in FIG. 6B. As shown in FIG. 6B, the change in blood flow rate in the periorbital region 60 is visualized as much lighter relative to that shown in FIG. 6A. Likewise, cheek region 62 is also visualized in a much lighter manner, as is a majority of facial skin 64, when compared to that of FIG. 6A.

The difference in the visualization of blood flow rate data between FIG. 6A and FIG. 6B is significant. The differences shown in the visualization of blood flow rate intensities are represented in such Figures with the lighter or brighter regions indicating the highest degree of change in blood flow rate. In other words, as the response to the question is answered deceptively, the change in blood flow rate from the time prior to the question to a time during the deceptive response is visualized in the Figures by the lighter representation of the face in FIG. 6B versus that shown in FIG. 6A.

Such differences between FIG. 6A and FIG. 6B are in direct contrast to the lack of differences in the visualized raw

In column 7, line 51 – column 8, line 8, the specifications of the Pavlidis patent specifically states:

thermal image data shown for such individuals in FIGS. 5A-5B. As a result, according to the present invention, with amplification of the thermal image data (e.g., transformation of such thermal image data to change in blood flow rate over time), determination of whether a person's response to a question is deceptive or non-deceptive can be attained.

In view of the preceding generalities, an illustrative embodiment of a polygraph system 10 according to the present invention shall be described with reference to FIG. 1. In conjunction with this polygraph system 10, preferably, various software routines or algorithms 16 are generally described for carrying out various steps of one or more embodiments of a polygraph method (e.g., polygraph method 50 shown in FIG. 4) for determining whether response by an individual (e.g., a statement by an individual) is deceptive or non-deceptive (e.g., whether a person is being deceitful or truthful).

The polygraph system 10, e.g., a system for determining whether an elicited response from a person 30 is deceptive or non-deceptive, is generally illustrated in FIG. 1. The polygraph system 10 includes a thermal infrared image device 12 operable to provide suitable thermal image data representative of a scene in which individual 30 (see also FIG. 3) is located. The thermal image data from the thermal infrared image device 12 is provided to a computing apparatus 14.

Preferably, computing apparatus 14 includes a computer system operable to execute software 16 to provide for the determination of the deceptive or non-deceptive state of a person based on thermal image data transformed to blood flow rate data. Although the computing apparatus 14 may be implemented using software 16 executable using a processor apparatus, other specialized hardware may also provide the functionality required to provide a user with information as to the non-deceptive or deceptive state of an individual 30. As such, the term computing apparatus as used herein includes specialized hardware in addition to or as an alternative to a processor apparatus capable of executing various software routines.

The computing apparatus, which shall be referred to hereinafter in conjunction with reference numeral 14, may be, for example, any fixed or mobile computer system, e.g., a personal computer. The exact configuration of the computer system is not limiting and most any device capable of providing suitable computing capabilities may be used according to the present invention. Further, various peripheral devices, such as a computer display, a mouse, a keyboard, a printer, etc., are contemplated to be used in combination with a processor in the computing apparatus 14.

The thermal infrared image device 12 is preferably one or more thermal cameras having a pixel array sensitive to the mid-infrared and/or far-infrared bands of the electromagnetic spectrum. For example, the thermal infrared image device 12 may be an uncooled thermal camera sensitive in the far-infrared band (i.e., the 8 microns to 14 microns band) available from Raytheon and provided under the trade designation ExplorIR. Further, for example, the thermal infrared image device 12 may be a mid-infrared camera sensitive in the mid-infrared band (i.e., the 3 microns to 5 microns band) available from Raytheon under the trade designation Radiance HS Mid-Infrared Camera.

As indicated previously, the human body and face emit in both the mid-infrared and far-infrared bands of the electromagnetic spectrum. Therefore, preferably, both a far-infrared camera and a mid-infrared camera are used to

provide thermal image data such that the data in the far-infrared band and the mid-infrared band may be compared to provide additional accuracy. However, one skilled in the art will recognize that either one or both of a far-infrared band and/or mid-infrared band camera may be used according to the present invention. Further, it is preferred that highly sensitive cameras be used when attempting to detect subtle changes in physiological response.

The far-infrared camera provided under the trade designation ExplorIR has a nominal temperature sensitivity of noise equivalent temperature difference (NETD) equal to 0.15° C. However, such performance is typically not obtained and the actual temperature sensitivity of the ExplorIR model may be above 0.5° C. As this is only a fair amount of facial temperature resolution, a certain amount of information may be masked thereby. The mid-infrared camera available from Raytheon under the trade designation Radiance HS Mid-Infrared Camera may be calibrated for a particular setting with nonlinear equations for improved accuracy. It generally has an NETD equal to 0.025° C. A calibration process may be complemented with a small, highly accurate (0.01° C.) differential black body for near perfect scene temperature reference.

The computer apparatus 14 includes software components 16 for operation on thermal facial image data provided from thermal infrared camera 12. One or more of such software components 16 may be used to operate on the thermal image data, e.g., pixel data, provided from the thermal infrared camera 12 to determine whether an individual 30 is non-deceptive or deceptive with respect to an elicited response therefrom. Such algorithmic software components for analysis of the thermofacial images of an individual 30 are shown as a part of an exemplary flow or block diagram of the polygraph method 50 shown in FIG. 4.

As shown in the polygraph method 50 of FIG. 4, thermal image data 52, e.g., pixel data, of a scene in which the individual 30 is located is provided to the computer apparatus 14 and is thereafter operated upon by software 16. Such software 16 includes at least a transformation component (block 54) for transforming the captured thermal image data for a person to blood flow rate data and a classification component (block 56) for classifying the person as deceptive or non-deceptive based on the blood flow rate data.

Generally, transformation component 54 provides an algorithm to transform thermal image data of the face 32 of an individual 30 to blood flow rate information (e.g., blood flow rate, change in blood flow rate over time, etc.) embodied as blood flow data. Preferably, such transformation changes the thermal image data into data representative of the change of blood flow rate over time (i.e., over a plurality of frames) of one or more regions of the face.

Such transformation may include any number of different processing techniques. For example, such transformation may include segmentation algorithms to separate thermal image data of the face from background of the thermal image data of the scene provided from camera 12. Likewise, a face partition component may provide the ability to partition the thermal image data of the face 32 into one or more regions. In one exemplary embodiment, as shown in FIG. 3 and as described elsewhere herein, the periorbital region 34 is preferably used according to the present invention.

It will be recognized by one skilled in the art that any number of regions may be used in the polygraph method described herein, e.g., the periorbital region, the cheek region, a forehead region, a nasal region, etc. However,

Based on the above evidence, the system and method disclosed by Pavlidis teaches or suggest the steps of determining physiological stress based on spectrum reflections, and measuring a blush that is characterized by increased blood flow to the cheeks.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 4, 6-8, 10, 12, 13, 15, 17-19, 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Pavlidis (US 6,854,879).

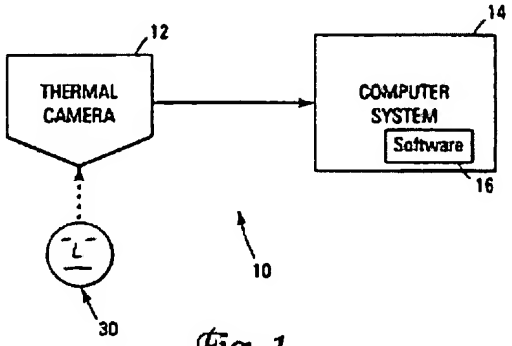

Fig. 1

With respect to claims 1, 2, 4, 6-8, and 10, Pavlidis discloses a system for detecting physiological stress in a subject, the system comprising: a processor (14, Figure 1) adapted to receive an image of the subject from a camera (12, Figure 1), adapted to identify a first spectral characteristic of the subject when the subject is unstressed and adapted to identify a second spectral characteristic of the subject when

stressed (col. 16, lines 35-40), the processor further adapted to compare an area of the image with the first and the second spectral characteristics and adapted to indicate whether the subject is experiencing physiological stress based on which of the spectral characteristics the image more closely coincides with (col. 15, lines 12-64), the second characteristic further comprising being coincident with one of a spectrum of sub-dermal blood flow and a spectrum of dermal hydration (col. 4, lines 46-67), whereby the second characteristic indicates a blush (col. 5, lines 5, 12), the processor coupled to the camera, (Figure 1), wherein the processor is coupled to a time source, a date source, and a location source to enable the processor to associate the time, date, and location with the image (col. 10, line 65 – col. 11, line 14; and see claims 23 and 27), wherein the system is installed in one of an airport, an interrogation room, and a store (col. 19, lines 40-46), wherein the processor identifies the first spectral characteristic from the image to detect an unstressed condition of the subject in real time, wherein the processor identifies the second spectral characteristic from the image to detect a stressed condition of the subject in real time (col. 10, line 65 – col. 11, line 14).

With respect to claims 12, 13, 15, 17-19, and 21, Pavlidis teaches all the structures as set forth above. The method concerning the steps of (1) detecting physiological stress of a subject, (2) observing an image of the subject with a system, the subject to include a first spectral characteristic when the subject is unstressed and a second spectral characteristic when the subject is stressed, (3) comparing an area of the image to the first spectral characteristic with the system, (4) comparing the area of the image to the second spectral characteristic with the system (5) determining with the

system which of the spectral characteristics the area of the image more closely coincides with to detect if the subject is experiencing stress, (6) selecting the second spectral characteristic from the group consisting of a spectrum of sub-dermal blood flow and a spectrum of dermal hydration and wherein the second spectral characteristic indicates a blush, (7) coupling a camera to the system whereby the camera inputs the image to the system, (8) associating a time, a date, and a location with the image (9) installing the system in one of an airport, an interrogation room, and a store, (10) identifying the first spectral characteristic from the image in real time, and (11) identifying the second spectral characteristic from the image in real time, would be inherently met by the disclosure.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3, 9, 11, 14, 20, 22-25, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pavlidis in view of Elli Angelopoulou (*The Reflectance Spectrum of Human Skin*).

Pavlidis, teaches all the limitations of the claimed subject matter except for mentioning specifically a system wherein the attenuation occurs near a frequency selected from the group consisting of about 542 nanometers, about 560 nanometers,

about 576 nanometers, about 1400 nanometers, and about 1700 nanometers, wherein the processor is adapted to identify the first spectral characteristic from a back of the hand of the subject, wherein the processor identifies the second spectral characteristic from a palm of the hand of the subject, a processor further adapted to compare the first and the second areas of skin and adapted to indicate whether the subject is experiencing physiological stress based on an attenuation at a pre-selected frequency of a spectrum between the first and the second areas of skin, wherein the attenuation is representative of a change in one of a spectrum of sub-dermal blood flow and a spectrum of dermal hydration and wherein the attenuation indicates a blush.

However, the system wherein the attenuation occurs near a frequency selected from the group consisting of about 542 nanometers, about 560 nanometers, about 576 nanometers, about 1400 nanometers, and about 1700 nanometers, wherein the processor is adapted to identify the first spectral characteristic from a back of the hand of the subject, wherein the processor identifies the second spectral characteristic from a palm of the hand of the subject, a processor further adapted to compare the first and the second areas of skin and adapted to indicate whether the subject is experiencing physiological stress based on an attenuation at a pre-selected frequency of a spectrum between the first and the second areas of skin, wherein the attenuation is representative of a change in one of a spectrum of sub-dermal blood flow and a spectrum of dermal hydration and wherein the attenuation indicates a blush are considered conventional in the art as evidenced by the teachings of Elli Angelopoulou (*The Reflectance Spectrum of Human Skin*).

Elli Angelopoulou discloses a system wherein the attenuation occurs near a frequency selected from the group consisting of about 542 nanometers, about 560 nanometers, about 576 nanometers, about 1400 nanometers, and about 1700 nanometers, wherein the processor is adapted to identify the first spectral characteristic from a back of the hand of the subject, wherein the processor identifies the second spectral characteristic from a palm of the hand of the subject, a processor further adapted to compare the first and the second areas of skin and adapted to indicate whether the subject is experiencing physiological stress based on an attenuation at a pre-selected frequency of a spectrum between the first and the second areas of skin, wherein the attenuation is representative of a change in one of a spectrum of sub-dermal blood flow and a spectrum of dermal hydration and wherein the attenuation indicates a blush.

Based on the above observations, for a person of ordinary skill in the art, modifying the system disclosed by Pavlidis, with the above discussed enhancements would have been considered obvious because such modifications would have improved the system to detect physiological stress in humans by providing more accurate data of the light reflected from the skin.

Claims 5 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pavlidis in view of Kataoka (*Development of a Skin Temperature Measuring System for Non-contact Stress Evaluation*).

Pavlidis, teaches all the limitations of the claimed subject matter except for mentioning specifically a system wherein the processor is coupled to an alarm and

activates the alarm if the area of the image more closely coincides with the second spectral characteristic.

However, the system wherein the processor is coupled to an alarm and activates the alarm if the area of the image more closely coincides with the second spectral characteristic is considered conventional in the art as evidenced by the teachings of Kataoka.

Kataoka discloses a system wherein the processor is coupled to an alarm and activates the alarm if the area of the image more closely coincides with the second spectral characteristic.

Based on the above observations, for a person of ordinary skill in the art, modifying the system disclosed by Pavlidis, with the above discussed enhancements would have been considered obvious because such modifications would have improved the system to detect physiological levels of stress induced by an emergent condition providing more accurate data of skin temperature changes.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John F. Ramirez whose telephone number is (571) 272-8685. The examiner can normally be reached on (Mon-Fri) 7:30 - 4:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian L. Casler can be reached on (571) 272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JFR
03/10/06

BRIAN L. CASLER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700